

Examiner's Statement and Reasons for Allowance

RCE

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/11/11 has been entered.

Interview

An interview with Mr. Brett Lovejoy was conducted on 5/11/11 before the filing of the RCE. See the Interview Summary mailed on 5/16/11.

Examiner's Statement

The rejection of claims 1, 117-126, 129, 133-136, 138, 140-141, 147-148, 150-163, and 170-178 under 35 USC 112, first paragraph, set forth in the final rejection mailed on 12/7/10 is withdrawn in view of the Interview referred to above and the amendment filed on 5/11/11.

Claims 138, 141, and 151, previously withdrawn from further consideration as being drawn to nonelected species, have been rejoined and fully examined.

It is noted that there is an pending ODP rejection of the claims in co-pending application 12/238216 over the claims of the present application. However, the present application is senior to the co-pending application.

Claims 1, 117-126, 129, 133-136, 138, 140-141, 147-148, 150-163, and 170-178 are pending and allowed.

Reasons for Allowance

The following is an examiner's statement of reasons for allowance:

The prior art does not teach or suggest a method for constructing a variant set for modifying a biopolymer of interest as claimed, or a computer program product for performing the method steps, the method comprising the steps of:

a) identifying a plurality of positions in said biopolymer of interest and, for each respective position in said plurality of positions, one or more substitutions for the respective position, wherein the plurality of positions and the one or more substitutions for each respective position in the plurality of positions collectively define a biopolymer sequence space;

b) selecting a first plurality of variants of the biopolymer of interest thereby forming a variant set, wherein said variant set comprises a subset of said biopolymer sequence space;

c) measuring a property of all or a portion of the variants in the variant set; and

d) modeling, using a suitably programmed computer, a sequence-activity relationship between (i) one or more substitutions at one or more positions of the biopolymer of interest represented by the variant set and (ii) the property measured for all or the portion of the variants in the variant set, wherein the sequence-activity relationship has the form

$$Y = f(w_1x_1, w_2x_2, \dots, w_ix_i)$$

wherein,

Y is a quantitative measure of the property;

x_i is a descriptor of a substitution, a combination of substitutions, or a component of one or more substitutions, at one or more positions in the plurality of positions; w_i is a weight applied to the descriptor x_i ; and $f()$ is a mathematical function; and

wherein the modeling comprises:

i) optimizing, using a suitably programmed computer, the sequence-activity relationship by adjusting individual weights w_i for each said descriptor x_i using a refinement algorithm that minimizes the difference between the predicted values and the real values of Y from partial data, wherein the partial data is the first plurality of variants with either (1) individual sequences left out on a random basis or (2) individual substitutions at positions in the plurality of positions left out on a random basis, and

ii) repeating the optimizing i) a plurality of times thereby obtaining, for each respective substitution or combination of substitutions x_i , (a) an average value for the weight w_i describing a relative or absolute contribution of the respective substitution or combination of substitutions x_i to Y , and (b) a standard deviation, variance or other measure of confidence in the weight w_i describing the relative or absolute contribution of the respective substitution or combination of substitutions x_i to Y .

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Inquiries

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shubo (Joe) Zhou, whose telephone number is 571-272-0724. The examiner can normally be reached Monday-Friday from 8 A.M. to 4 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marjorie Moran, can be reached on 571-272-0720. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/SHUBO (Joe) ZHOU/

Primary Examiner, Art Unit 1631